## Remarks

The title and claims 1 and 12 have been amended. Review and reconsideration are respectfully requested.

The title has been amended in the manner suggested in the Office action.

Claims 1, 2, 4 and 12 are rejected as being anticipated by U.S. Pat. No. 5,379,457 to Nguyen. Claims 3, 5-8 and 13 are objected to but are indicated to include allowable subject matter. Claims 9-11 are allowed. The applicant appreciates the indication of allowable subject matter. However, claim 13 is an independent claim, and therefore it is submitted that claim 13 should be indicated to be allowed.

Claims 1 and 12 have been amended so that the current source is now explicitly referred to as a constant current source. Also, the connections of the emitter resistances have now been specified more explicitly and correspond to the arrangements shown in the drawings.

Nguyen discloses a mixer of the Gilbert-cell type operated in the single-balanced configuration. The transistors Q1 to Q4 are arranged as two long-tail pairs but they function as current-steering arrangements so as to multiply the signal from the local oscillator with the radio frequency input signal in order to convert the input signal to a constant intermediate frequency signal. The transistors Q5 and Q6 are arranged as transconductance stages for converting the input voltage to corresponding differential currents which feed the emitters of the long-tail pairs. In particular, as the voltage at the input 18 varies, the output currents from the collectors of the transistors Q5 and Q6 vary in opposite directions so as to provide a differential current output. Thus, Q5 and Q6 are not constant current sources and do not set the tail currents of the long-tailed pairs in a predetermined ratio; the ratio varies with input voltage and this is intrinsic to the way this arrangement works.

The emitters of the transistors Q5 and Q6 are connected via respective resistors R7 and R8 to the supply input and degenerative feedback is provided at the emitters by the series combination of the resistor R1 and the inductor $L_E$. Again, this is essential to the operation of the mixer disclosed by Nguyen. Although the Examiner attempts to identify the transistors Q5 and Q6 with, for example, the transistors T1 and T2 in Figure 4 of the present application, this is incorrect and, in fact, the resistors R7 and R8 in Nguyen are equivalent to the

transistors T1 and T2, in so far as any equivalents can be identified. The transistors Q5 and Q6 are effectively equivalent to the transistors T3 to T4 in Figure 5 of our application. This is because the transistors T3 to T4 are acting as transconductance devices to convert the differential input voltage to differential output currents feeding the current steering stage constituted by the transistors T7 to T10. Thus, the resistors R7 and R8 are actually the current sources in Nguyen and are in some sense equivalent to the current source formed by the transistors T1 and T2.

Claims 1 and 12 have been amended so as to indicate that the emitter resistor R1 of the first transistor (T1) exclusively connects the emitter of this transistor to the supply input and the emitter resistor R2 of the transistor T2 exclusively connects the emitter to the emitter of the transistor T1 so that the emitter of the transistor T2 is exclusively connected by the series circuit of the resistors R1 and R2 to the supply input. Thus, the constant current source formed by the transistors T1 and T2 in combination with the resistances R1 and R2 and the bias voltage source 1 supplies constant output currents which are in a fixed constant ratio of predetermined size with respect to each other. There is no disclosure whatever of such a structure in Nguyen. In particular, as explained above, the varying radio frequency voltage at the input 18 of the Nguyen arrangement results in differentially varying output currents from the transistors Q5 and Q6, which act as a differential transconductance stage and not as a constant current source.

Thus, the arrangement of claims 1 and 12 as amended are clearly novel with respect to Nguyen. Further, this arrangement has the advantages explained in the description. For example, the paragraph beginning at page 6 line 7 indicates the problems with known types of constant current sources and the following paragraph explains that the present invention does not suffer from this problem but, instead, completely overcomes it. The present invention therefore achieves a substantial technical advantage over the cited art.

Thus, in sum, it is submitted that the application is in a condition for allowance, and a formal notice thereof is respectfully solicited.

Applicant(s) hereby request a 1 month extension of time. The Commissioner is hereby authorized to charge any additional fees required, including the fee for an extension of time, or to credit any overpayment to Deposit Account 20-0809.

Respectfully submitted,

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